CLAIMS

1. An apparatus (1) for the axial movement of a piping (2) or the like, characterized in that it comprises a support frame (5), a first hoisting element (11) fixed to said frame (5) and a second movable hoisting element (13) apt to slide on guides (12), and actuation means (15, 16, 17; 70, 71, 72) apt to move said second hoisting element (13) giving thereto a cyclic reciprocating motion along said guides (12) between a bottom dead center (BDC) and a top dead center (TDC), each of said first and second sliding elements (11, 13) comprising means (22, 23, 24, 25, 26, 30, 31; 90, 92, 93, 94) for tightening the piping (2) to be moved, the arrangement being such that said piping (2), owing to said tightening means (22, 23, 24, 25, 26, 30, 31; 90, 92, 93, 94), be constrained to said second sliding element (13) during a first half of the movement cycle and constrained to said first sliding element (11) during a second half of said cycle, overall attaining an axial movement of said piping (2) substantially equal to the distance between said top dead center (TDC) and said bottom dead center (BDC).

2. The apparatus (1) according to claim 1, wherein said first and second hoisting elements (11, 13) are mounted in a manner such as to be constantly aligned during their relative motion.

3. The apparatus (1) according to claim 1 or 2, further comprising a third top hoisting element (50), integral to said frame (5) and aligned to said first and second hoisting elements (11, 13).

4. The apparatus (1) according to one of the preceding claims, wherein each of said hoisting elements (11, 13, 50) comprises a boxed body having a through hole (20), apt to allow the passage of the piping (2) to be moved.

5. The apparatus (1) according to one of the preceding claims, wherein said second movable hoisting element (13) comprises wheels (14) apt to slide along said guides (12).

6. The apparatus (1) according to claim 5, wherein said guides (12) comprise respective rack portions and said wheels (14) are gears.

7. The apparatus (1) according to one of the preceding claims, wherein said actuation means (15, 16, 17) comprises an electric motor (15) and a connecting rod system (16) for driving motion to said second movable hoisting element (13).

8. The apparatus (1) according to one of the claims 1 to 7, wherein said actuation means (15, 16, 17; 70, 71, 72) comprises a hydraulic drive system comprising one or more rams (17) connected between said frame (5) and said second movable hoisting element (13).

9. The apparatus (1) according to one of the claims 1 to 6, wherein said actuation

means (15, 16, 17; 70, 71, 72) comprises an electric motor (70) and a worm screw (71)-nut screw (72) system for the transfer of motion to said second hoisting element (13).

10. The apparatus (1) according to one of the preceding claims, wherein each of said hoisting elements (11, 13, 50) comprises a wall portion (21), internal to said passage hole (20).

11. The apparatus (1) according to claim 10, wherein said wall portion (21) has a substantially semi-cylindrical shape and a surface made in a manner such as to exhibit a high friction coefficient.

12. The apparatus (1) according to claim 11, wherein said surface of said wall portion (21) has knurls and/or toothings apt to mesh to an external wall of said piping (2).

13. The apparatus (1) according to one of the preceding claims, wherein said tightening means (22, 23, 24, 25, 26, 30, 31; 90, 92; 93, 94) comprises a roll element (22), substantially having a globe-shaped contour, apt to cooperate with an external wall of said piping (2).

14. The apparatus (1) according to claim 13, wherein said roll element (22) has a surface made in a manner such as to exhibit a high friction coefficient.

15. The apparatus (1) according to claim 14, wherein said surface of said roll element (22), has knurls and/or toothings apt to mesh to an external wall of said piping (2).

16. The apparatus (1) according to one of the claims 12 to 12, wherein said roll element (22) is integral to a rotation shaft (23) and mounted on a pair of gears (24).

17. The apparatus (1) according to one of the claims 1 to 14, wherein said tightening elements (23, 24, 25, 26, 30, 31; 90, 92; 93, 94) comprise a tie block (90) having a recess reproducing in negative the contour of said piping (2).

18. The apparatus (1) according to claim 17, wherein the surface of said recess (91) exhibits a high friction coefficient.

19. The apparatus (1) according to claim 18, wherein the surface of said recess (91) has knurls and/or toothings apt to mesh on the external wall of said piping (2).

20. The apparatus (1) according to one of the claims 17 to 19, wherein said tie block (90) is pivoted onto a first shaft, said first shaft (23) being mounted on a pair of gears (24), and fixed joint connected to a second shaft (92).

21. The apparatus (1) according to any one of the claims 13 to 16, wherein said tightening means (22, 23, 24, 25, 26, 30, 31; 90, 92; 93, 94) comprises a tie block (93), incorporating a recess (95) reproducing in negative the contour of said piping (2), apt to cooperate with said roll element (22) for the joint tightening of said piping

(2), wherein the rotary motion of said roll element (22) is transformed into translatory motion of said tie block (93) via an element (94) substantially shaped as a connecting rod, a first end (98) of said element (94) being hinged to said roll element (22) and a second end (99) being hinged to said tie block (93), so that the coming to hold of said tie block (93) substantially works as a stop to the advance of said roll (22).

22. The apparatus (1) according to claim 16 or 20, wherein said gears (24) are coupled to respective racks (25).

23. The apparatus (1) according to claim 22, wherein said racks (25) are linear and mounted integrally to said boxed body in a manner tilted with respect both to a working plane and to said piping (2) to be moved.

24. The apparatus (1) according to claim 22, wherein said racks (25) have a curvilinear sliding contour.

25. The apparatus (1) according to one of the claims 16 to 24, wherein said tightening means (22, 23, 24, 25, 26, 30, 31; 90, 92; 93, 94) further comprises a pair of guide slots (26), obtained on the lateral sides of said boxed body and parallel to said racks, apt to the sliding of said shaft (23).

26. The apparatus (1) according to one of the claims 16 to 25, wherein said tightening means (22, 23, 24, 25, 26, 30, 31; 90, 92; 93, 94) further comprises one or more elastic elements (30) apt to return said roll element (22) in the direction of the piping (2) to be moved.

27. The apparatus (1) according to claim 26, wherein said elastic elements comprise two helical springs (30) connected between the ends of said shaft (23) and respective anchoring points (31) on said boxed body.

28. The apparatus (1) according to any one of the preceding claims, further comprising a control system, apt to allow the starting and/or the stopping of the apparatus.

29. The apparatus (1) according to any one of the preceding claims 3 to 28, wherein said third top hoisting element (50), comprises a release (60) for the extraction of the piping (2) once the latter has been moved.

30. The apparatus (1) according to claim 29, wherein said release (60) comprises a system of levers (61, 62) and a pair of racks (65) coupled to the gears (24), the arrangement being such that such levers, actuated by traction of a string (63), drag the racks (65) causing the rotation of the gears (24) and the moving of the roll (22) away from the piping (2).

31. The apparatus (1) according to any one of the preceding claims, further comprising a safety device, apt to automatically interrupt the operation of the

apparatus at the end of the step of moving the piping (2).

32. The apparatus (1) according to any one of the preceding claims, further comprising a control bar (40) slidably connected to said moving assembly (10), apt to cooperate with said hoisting elements (11) and (13) for the synchronization of the stages of the movement cycle.

33. The apparatus (1) according to the preceding claim, wherein said control bar (40) is apt to translate vertically in a manner such as to assume a first top position (A) and a second bottom position (B) by means of said hoisting element (13).

34. The apparatus (1) according to the preceding claim, comprising intercepting elements (42A, 42B, 42C, 42D, 42E) for the triggering of corresponding actuation mechanisms, mounted on said hoisting elements (11, 13), at said first and second position (A, B) assumed by said control bar (40).

35. The apparatus (1) according to the preceding claim, wherein said intercepting elements comprise tabs (42A, 42B, 42C, 42E) obtained on said control bar (40).

36. The apparatus (1) according to the preceding claim, wherein said intercepting elements comprise projections (42D) integral to said frame (5).

37. The apparatus (1) according to claim 34, wherein said actuation mechanisms comprise a lever (41) apt to cooperate with an articulation of elements (43, 44, 46), varying their configuration so that said piping (2) be reciprocatingly constrained to said hoisting element (11) during a first half of said movement cycle and to said hoisting element (13) during a second half of said movement cycle.

38. The apparatus (1) according to the preceding claim, wherein the configuration of said articulation of elements (43, 44, 46) is fixed by pins (45).

39. The apparatus (1) according to the preceding claim, wherein said pins (45), located at the articulation between said rods (44) and said arm (43), are selectively extractable from respective recesses by means of a control system, according to the position reached by said control bar (40).

40. The apparatus (1) according to the preceding claim, wherein said control system comprises actuators (47).

41. The apparatus (1) according to the preceding claim, wherein said actuators (47) are of the kind with photoelectric detection position transducers.

42. The apparatus (1) according to any one of the preceding claims, comprising optoelectric detection devices for the synchronization of the movement cycle.

43. The apparatus (1) according to the preceding claim, wherein said detection devices are photoelectric sensors (80).